DO NOT ENTER: /JM/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	§	BEFORE THE EXAMINER:
	§	
Baiyi ZHAO *et al.*	§	James E. McDONOUGH
	§	
Serial No.: 10/693,584	§	Group Art Unit No.: 1793
	§	
Filed: October 24, 2003	§	Attorney Docket No.: 2002B130/2
	§	
For: *Late Transition Metal Catalysts for Olefin Oligomerizations*	§	Customer No.: 23455
	§	
	§	Date: June 20, 2008

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

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AMENDMENT AND RESPONSE UNDER 37 C.F.R. § 1.116

Sir:

This amendment is submitted in response to the Office Action dated February 22, 2008. Reconsideration of the application is requested.

Please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2.

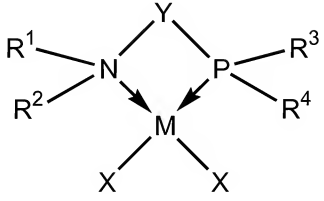
Remarks/Arguments begin on page 25.

Listing of Claims

The listing of claims below replaces all prior versions, and listings, of claims in this application:

1. (Canceled)

2. (Previously Presented) A composition of matter with the following formula:



wherein

(a) M is a Group-8, -9, or -10 transition metal, excluding palladium,

(b) N is nitrogen;

(c) P is phosphorus;

(d) R^1, R^2, R^3, and R^4 are hydrocarbyl radicals;

(e) Y is a hydrocarbyl bridge comprising a backbone wherein the backbone comprises a chain that is four or more carbon atoms long; and

(f) each X is independently methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl,

pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, hydride, phenyl, benzyl, phenethyl, tolyl, methoxy, ethoxy, propoxy, butoxy, dimethylamino, diethylamino, methylethylamino, phenoxy, benzoxy, allyl, 1,1-dimethyl allyl, 2-carboxymethyl allyl, 1,1,1,5,5,5-hexa-fluoroacetylacetonate, 1,1,1-trifluoro-acetylacetonate, and 1,1,1-trifluoro-5,5-di-methylacetylacetonate; or the two X's are connected to form catecholate, 3,5-dibutylcatecholate, 3,6-dibutylcatecholate, 3,6-dibutyl-4,5-dimethoxycatecholate, 3,6-dibutyl-4,5-dichlorocatecholate, 3,6-dibutyl-4,5-dibromocatecholate, 1,3-propylene, or 1,4-butylene.

3. (Previously Presented) The composition of matter of Claim 2 wherein R^1, R^2, R^3, and R^4 are C_1-C_{40} hydrocarbyls.

4. (Previously Presented) The composition of matter of Claim 3 wherein R^1, R^2, R^3, and R^4 are C_1-C_{30} hydrocarbyls.

5. (Previously Presented) The composition of matter of Claim 4 wherein R^1, R^2, R^3, and R^4 are methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, ethenyl, propenyl, butenyl, pentenyl, hexenyl, heptenyl, octenyl, nonenyl, decenyl, undecenyl, dodecenyl, ethynyl, propynyl, butynyl, pentynyl, hexynyl, heptynyl, octynyl, nonynyl, decynyl, undecynyl, dodecynyl, phenyl, benzyl, phenethyl, tolyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, cyclononyl, cyclodecyl, or cyclododecyl radicals.

6. (Previously Presented) The composition of matter of Claim 5 wherein R^1, R^2, R^3, and R^4 are methyl, ethyl, propyl, butyl, cyclohexyl, phenyl, tolyl, benzyl, or phenethyl.

7. (Canceled)

8. (Canceled)

9. (Previously Presented) The composition of matter of Claim 2 wherein both X ligands are dimethylamino, diethylamino, methylethylamino, phenoxy, or benzoxy.

10. (Previously Presented) The composition of matter of Claim 2 wherein both X ligands are independently methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, hydride, phenyl, benzyl, phenethyl, or tolyl.

11. (Previously Presented) The composition of matter of Claim 2 wherein both X ligands are independently allyl, or 1,1-dimethyl allyl.

12. (Previously Presented) The composition of matter of Claim 2 wherein M is selected from the group consisting of nickel, iron, cobalt, platinum, ruthenium, rhodium, and iridium.

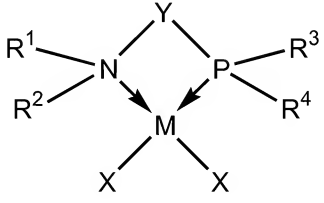
13. (Previously Presented) The composition of matter of Claim 12 wherein M is iron, nickel, or cobalt.

14. (Previously Presented) The composition of matter of Claim 12 wherein Y is selected from the group consisting of butylene, pentylene, hexylene, heptylene, octylene, nonylene, decylene, undecylene, dodecylene, tridecylene, tetradecylene, pentadecylene, hexadecylene, heptadecylene, octadecylene, nonadecylene, eicosylene, heneicosylene, docosylene, tricosylene, tetracosylene, pentacosylene, hexacosylene, heptacosylene, octacosylene, nonacosylene, triacontylene, cyclohexylene, cyclooctylene, cyclodecylene, cyclododecylene, biphenyl, butenylene, penentylene, hexenylene, heptenylene, octenylene, nonenylene, decenylene, undecenylene, dodecenylene, hexynylene, heptynylene, octynylene, nonynylene, decynylene, undecynylene, dodecynylene, butadienylene, pentadienylene, hexadienylene, heptadienylene,

octadienylene, nonadienylene, decadienylene, undecadienylene, dodecadienylene, hexatrienylene, octatrienylene, decatrienylene, and dodecatrienylene radicals.

15. (Previously Presented) The composition of matter of Claim 2 wherein Y is biphenyl.

16. (Previously Presented) A composition of matter with the following formula:



wherein

M is a Group-8, -9, or -10 transition metal, excluding palladium,

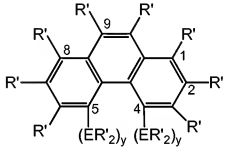
N is nitrogen;

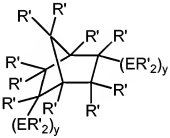
P is phosphorus;

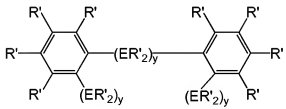
R^1, R^2, R^3, and R^4 are hydrocarbyl radicals;

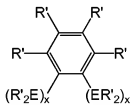
each X is independently methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, hydride, phenyl, benzyl, phenethyl, tolyl, methoxy, ethoxy, propoxy, butoxy,

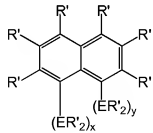
dimethylamino, diethylamino, methylethylamino, phenoxy, benzoxy, allyl, 1,1-dimethyl allyl, 2-carboxymethyl allyl, 1,1,1,5,5,5-hexa-fluoroacetylacetonate, 1,1,1-trifluoro-acetylacetonate, and 1,1,1-trifluoro-5,5-di-methylacetylacetonate, or the two X's are connected to form catecholate, 3,5-dibutylcatecholate, 3,6-dibutylcatecholate, 3,6-dibutyl-4,5-dimethoxycatecholate, 3,6-dibutyl-4,5-dichlorocatecholate, 3,6-dibutyl-4,5-dibromocatecholate, 1,3-propylene, or 1,4-butylene; and Y has one of the following formulas:

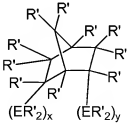


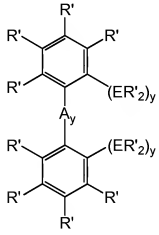


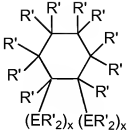


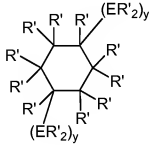


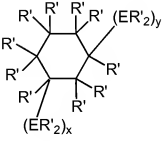


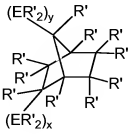


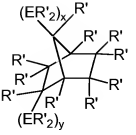


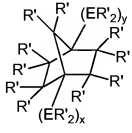


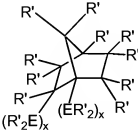


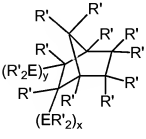


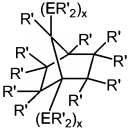


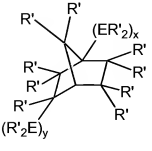


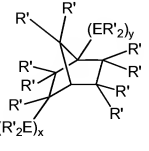












where

R' are hydrogen or C_1-C_{50} hydrocarbyl radicals;

A is a non-hydrocarbon atom functional group;

E is a Group-14 element;

x is an integer from 1 to 4; and

y is an integer from 0 to 4.

17. (Previously Presented) The composition of Claim 16 wherein A is C=O, C=S, O, S, SO_2, NR*, PR*, BR*, $SiR*_2$, or $GeR*_2$ wherein each R* is a hydrocarbyl or halocarbyl radical.

18. (Withdrawn) A composition of matter comprising the reaction product of an activator and the composition of matter of Claim 2.

19. (Withdrawn) A composition of matter comprising the reaction product of

(a) the composition of matter of Claim 18 and

(b) ethylene, propylene, 1-butene, or a mixture of any two or all three of ethylene, propylene, and 1-butene.

20. (Withdrawn) A polymerization method comprising the step of providing at least one composition of matter of Claim 2.

21. (Withdrawn) The polymerization method of Claim 20 wherein the activity of the composition of matter exceeds 8000 moles of ethylene per mole transition metal per hour.

22. (Withdrawn) The polymerization method of Claim 20 further comprising recovering a product comprising greater than 50 wt% of linear C_4-C_{14} α-olefins based on the total weight of polymerized product.

23. (Withdrawn) The polymerization method of Claim 22 wherein the product comprises greater than 80 wt% of linear C_4-C_{14} α-olefins.

24. (Withdrawn) The polymerization method of Claim 23 wherein the product comprises greater than 50 wt% of linear C_4 and C_6 α-olefins.

25. (Withdrawn) The polymerization method of Claim 24 wherein the product comprises greater than 80 mol% of linear C_4 and C_6 α-olefins.

26. (Withdrawn) A composition of matter comprising the reaction product of:

(a) an activator; and

(b) a catalyst precursor with the formula of the composition of matter of claim 2, wherein:

(i) M is iron, nickel, or cobalt; and

(ii) R^1, R^2, R^3, and R^4 are independently methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, ethenyl, propenyl, butenyl, pentenyl, hexenyl, heptenyl, octenyl, nonenyl, decenyl, undecenyl, dodecenyl, ethynyl, propynyl, butynyl, pentynyl, hexynyl, heptynyl, octynyl, nonynyl, decynyl, undecynyl, dodecynyl, phenyl, benzyl, phenethyl, tolyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, cyclononyl, cyclodecyl, or cyclododecyl radicals.

27. (Withdrawn) A composition of matter comprising the reaction product of:

(a) an activator; and

(b) a catalyst precursor with the formula of the composition of matter of claim 2 wherein:

(i) M is nickel, iron, cobalt, platinum, ruthenium, rhodium, or iridium;

(ii) R^1, R^2, R^3, and R^4 are independently methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, ethenyl, propenyl, butenyl, pentenyl, hexenyl, heptenyl, octenyl, nonenyl, decenyl, undecenyl, dodecenyl, ethynyl, propynyl, butynyl, pentynyl, hexynyl, heptynyl, octynyl, nonynyl, decynyl, undecynyl, dodecynyl, phenyl, benzyl, phenethyl, tolyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, cyclononyl, cyclodecyl, or cyclododecyl radicals; and

(iii) X are independently dimethylamide, diethylethoxide, phenoxide, methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, hydride, phenyl, benzyl, phenethyl, tolyl, dimethylamino, diethylamino, methylethylamino; or two X's are connected to form catecholate, 3,5-dibutylcatecholate, 3,6-dibutylcatecholate, 3,6-dibutyl-4,5-dimethoxycatecholate, 3,6-dibutyl-4,5-dichlorocatecholate, 3,6-dibutyl-4,5-dibromocatecholate, 1,3-propylene, or 1,4-butylene.

28. (Withdrawn) The composition of matter of claim 27 wherein

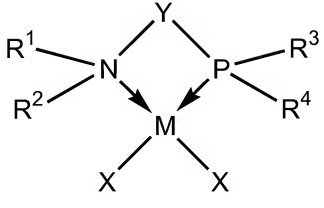
(i) R^1, R^2, R^3, and R^4 are independently selected from methyl, ethyl, and propyl; and

(ii) Y is selected from butylene, pentylene, hexylene, heptylene, octylene, nonylene, decylene, undecylene, dodecylene, tridecylene, tetradecylene, pentadecylene, hexadecylene, heptadecylene, octadecylene, nonadecylene, eicosylene, heneicosylene, docosylene, tricosylene, tetracosylene, pentacosylene, hexacosylene, heptacosylene, octacosylene, nonacosylene, triacontylene, cyclohexylene, cyclooctylene, cyclodecylene, cyclododecylene, biphenyl, butenylene, penentylene, hexenylene, heptenylene, octenylene, nonenylene, decenylene, undecenylene, dodecenylene, hexynylene, heptynylene, octynylene, nonynylene, decynylene, undecynylene, dodecynylene, butadienylene, pentadienylene, hexadienylene, heptadienylene, octadienylene, nonadienylene, decadienylene, undecadienylene, dodecadienylene, hexatrienylene, octatrienylene, decatrienylene, and dodecatrienylene radicals.

29. (Withdrawn) A composition of matter comprising the reaction product of:

(a) an activator; and

a catalyst precursor with the following formula:



wherein

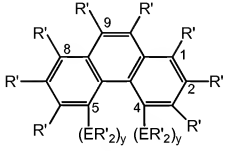
M is a Group-8, -9, or -10 transition metal, excluding palladium,

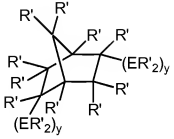
N is nitrogen;

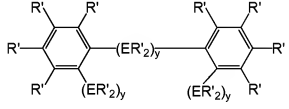
P is phosphorus;

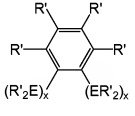
R^1, R^2, R^3, and R^4 are hydrocarbyl radicals;

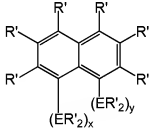
Y is represented by one of the following formulas:

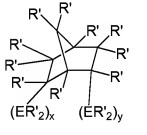


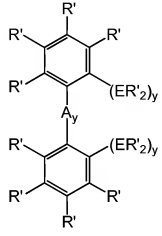











R'
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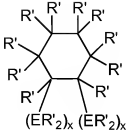
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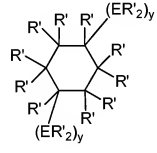
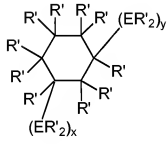
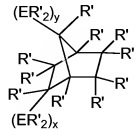
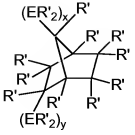
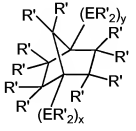
(ER'2)x
(ER'2)x

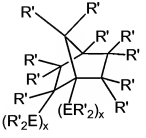

(ER'2)y
R'
R'
R'
R'
R'
R'
R'
R'
R'
R'
(ER'2)y

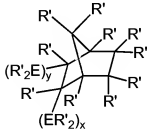

R'
R'
R'
R'
(ER'2)y
R'
R'
R'
R'
R'
R'
(ER'2)x

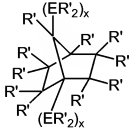


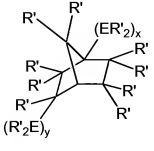


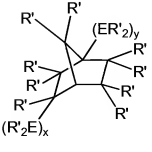












where

- R' are independently, hydrogen or C_1-C_{50} hydrocarbyl radicals;

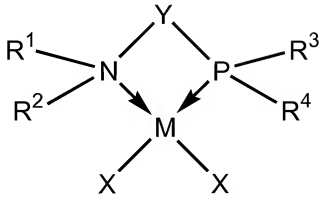
- A is a non-hydrocarbon atom functional group;
- E is a Group-14 element;
- x is an integer from 1 to 4;
- y is an integer from 0 to 4; and

X are independently dimethylamide, diethylethoxide, phenoxide, methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, hydride, phenyl, benzyl, phenethyl, tolyl, diethylamino, methylethylaminodimethylamin; or two X's are connected to form _catecholate, 3,5-dibutylcatecholate, 3,6-dibutylcatecholate, 3,6-dibutyl-4,5-dimethoxycatecholate, 3,6-dibutyl-4,5-dichlorocatecholate, 3,6-dibutyl-4,5-dibromocatecholate, 1,3-propylene, or 1,4-butylene.

30. (Withdrawn) A polymerization method wherein the catalysts activity exceeds 8000 moles of ethylene per mole transition metal per hour comprising the step of providing at least one composition of matter comprising the reaction product of:

(a) an activator; and

(b) a catalyst precursor with the following formula:



wherein

(i) M is iron, nickel, or cobalt,

(ii) N is nitrogen;

(iii) P is phosphorus;

(iv) R^1, R^2, R^3, and R^4 are independently methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, ethenyl, propenyl, butenyl, pentenyl, hexenyl, heptenyl, octenyl, nonenyl, decenyl, undecenyl, dodecenyl, ethynyl, propynyl, butynyl, pentynyl, hexynyl, heptynyl, octynyl, nonynyl, decynyl, undecynyl, dodecynyl, phenyl, benzyl, phenethyl, tolyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, cyclononyl, cyclodecyl, or cyclododecyl radicals;

(v) Y is a hydrocarbyl bridge comprising a backbone wherein the backbone comprises a chain that is four or more carbon atoms long; and

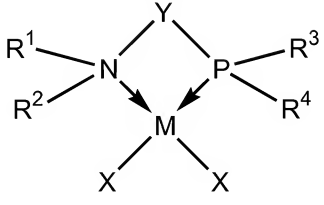
(vi) X are independently dimethylamide, diethylethoxide, phenoxide, methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl,

tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, hydride, phenyl, benzyl, phenethyl, tolyl, dimethylamino, diethylamino, methylethylamino; or two X's are connected to form catecholate, 3,5-dibutylcatecholate, 3,6-dibutylcatecholate, 3,6-dibutyl-4,5-dimethoxycatecholate, 3,6-dibutyl-4,5-dichlorocatecholate, 3,6-dibutyl-4,5-dibromocatecholate, 1,3-propylene, or 1,4-butylene.

31. (Withdrawn) A polymerization method wherein the catalysts activity exceeds 8000 moles of ethylene per mole transition metal per hour comprising the step of providing at least one composition of matter comprising the reaction product of:

(a) an activator; and

(b) a catalyst precursor with the following formula:



wherein

(i) M is nickel, iron, cobalt, platinum, ruthenium, rhodium, or iridium;

(ii) N is nitrogen;

(iii) P is phosphorus;

(iv) R^1, R^2, R^3, and R^4 are independently methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, ethenyl, propenyl, butenyl, pentenyl, hexenyl, heptenyl, octenyl, nonenyl, decenyl, undecenyl, dodecenyl, ethynyl, propynyl, butynyl, pentynyl, hexynyl, heptynyl, octynyl, nonynyl, decynyl, undecynyl, dodecynyl, phenyl, benzyl, phenethyl, tolyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, cyclononyl, cyclodecyl, or cyclododecyl radicals;

(v) Y is a hydrocarbyl bridge comprising a backbone wherein the backbone comprises a chain that is four or more carbon atoms long; and

(vi) X are independently dimethylamide, diethylethoxide, phenoxide, methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, hydride, phenyl, benzyl, phenethyl, tolyl, dimethylamino, diethylamino, methylethylamino or two X's are connected to form catecholate, 3,5-dibutylcatecholate, 3,6-dibutylcatecholate, 3,6-dibutyl-4,5-dimethoxycatecholate, 3,6-dibutyl-4,5-dichlorocatecholate, 3,6-dibutyl-4,5-dibromocatecholate, 1,3-propylene, or 1,4-butylene.

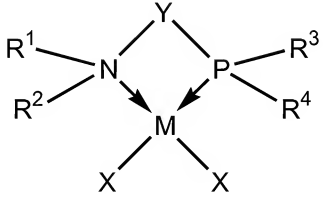
32. (Withdrawn) The polymerization method of claim 31 wherein Y is a butylene, pentylene, hexylene, heptylene, octylene, nonylene, decylene, undecylene, dodecylene, tridecylene, tetradecylene, pentadecylene, hexadecylene, heptadecylene, octadecylene, nonadecylene, eicosylene, heneicosylene, docosylene, tricosylene, tetracosylene, pentacosylene, hexacosylene, heptacosylene, octacosylene, nonacosylene, triacontylene, cyclohexylene, cyclooctylene, cyclodecylene, cyclododecylene, biphenyl, butenylene,

penentylene, hexenylene, heptenylene, octenylene, nonenylene, decenylene, undecenylene, dodecenylene, hexynylene, heptynylene, octynylene, nonynylene, decynylene, undecynylene, dodecynylene, butadienylene, pentadienylene, hexadienylene, heptadienylene, octadienylene, nonadienylene, decadienylene, undecadienylene, dodecadienylene, hexatrienylene, octatrienylene, decatrienylene, or dodecatrienylene radical.

33. (Withdrawn) A polymerization method wherein the catalysts activity exceeds 8000 moles of ethylene per mole transition metal per hour comprising the step of providing at least one composition of matter comprising the reaction product of:

(a) an activator; and

(b) a catalyst precursor with the following formula:



wherein

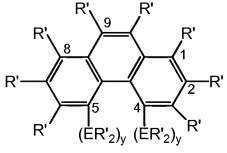
(i) M is a Group-8, -9, or -10 transition metal,

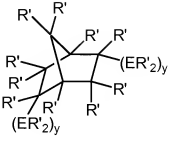
(ii) N is nitrogen;

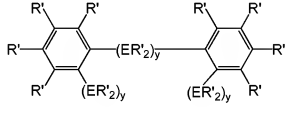
(iii) P is phosphorus;

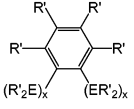
(iv) R^1, R^2, R^3, and R^4 are independently hydrocarbyl radicals;

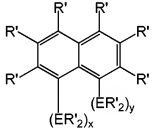
(v) Y is represented by one of the following formulas:

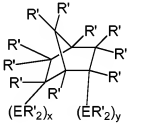


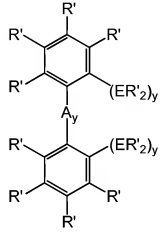


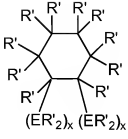


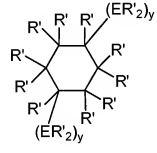


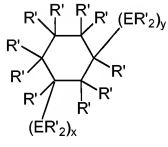


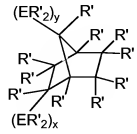


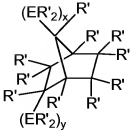

R'
R'
R'
R'
(ER'2)y
Ay
R'
(ER'2)y
R'
R'
R'

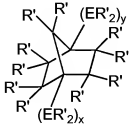

R'
R'
R'
R'
R'
R'
R'
R'
R'
R'
(ER'2)x
(ER'2)x

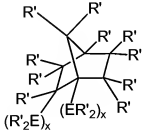

(ER'2)y
R'
R'
R'
R'
R'
R'
R'
R'
R'
R'
(ER'2)y

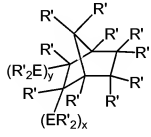

R'
R'
R'
R'
(ER'2)y
R'
R'
R'
R'
R'
R'
(ER'2)x

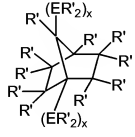

(ER'2)y
R'
(ER'2)x

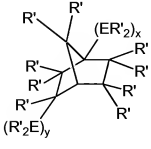

(ER'2)x
R'
(ER'2)y

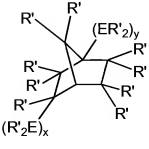

(ER'2)y
(ER'2)x


(R'2E)x
(ER'2)x


(R'2E)y
(ER'2)x


(ER'2)x


(ER'2)x
(R'2E)y


(ER'2)y
(R'2E)x

Where

- R' are independently, hydrogen or C_1-C_{50} hydrocarbyl radicals;
- A is a non-hydrocarbon atom functional group;
- E is a Group-14 element;
- x is an integer from 1 to 4; ~~and~~
- y is an integer from 0 to 4; and

(vi) X are independently dimethylamide, diethylethoxide, phenoxide, methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, octadecyl, nonadecyl, eicosyl, heneicosyl, docosyl, tricosyl, tetracosyl, pentacosyl, hexacosyl, heptacosyl, octacosyl, nonacosyl, triacontyl, hydride, phenyl, benzyl, phenethyl, tolyl, dimethylamino, diethylamino, or methylethylamino.

REMARKS

This amendment is submitted in response to the Office Action dated February 22, 2008. Claims 2-6 and 9-33 are present in this application. Claims 1, 7 and 8 are canceled. Claims 18-33 stand withdrawn. Claims 2-6 and 9-16 stand rejected. No claims are currently amended. Reconsideration of the application is requested.

Rejection under 35 USC § 103(a)

Claims 2-6 and 9-16 are rejected under 35 USC § 103(a) as being unpatentable over Buchwald in view of Qian (*Synthesis and Polymerization behavior of Various Substituted Half-Sandwich Titanium Complexes Cp'TiCl2(OR*) as Catalysts for Syndiotactic Polystyrene*, J. Mol. Cat. 208, 2004, 45-54). The Examiner admits that Buchwald does not disclose hydrocarbyls but suggests that Qian teaches substituting hydrocarbyls for halogens. Respectfully, this is a broad overstatement that is simply not correct. First halogen ligands are polar and carry a different charge than hydrocarbyl ligands, such as methyl. Clearly, they are not equivalent. Second, in many systems, a borate activator in combination with a halogenated catalyst precursor produces an inactive system while an alkylated precursor often, but not always, produces an active system. Thus, halogens and hydrocarbyls are not equivalent, particularly in borate activator containing systems. Furthermore, Qian is directed to group 4 metal compounds used to make polyolefins. Applicant's invention is directed to group 8, 9, and 10 metals. One of ordinary skill in the art would not look to a Group 4 reference for Group 8, 9 and 10 guidance. Complicated late transition metal alkyl complexes are harder to make than Group 4 alkyl complexes because they are significantly less stable. Further, the fact that diethyl zinc is commercially available is irrelevant to Applicant's claimed invention. Diethyl zinc is not a polymerization catalyst. Thus, the group 4 reference does not offer any significant insight for one of ordinary skill in the art.

Furthermore, Applicant disagrees that it is obvious to substitute halogens for alkyls on grounds that it has long been established that ..."*The effect of a modification of one prior art catalytic process in a manner employed in another prior art process which employs a different catalyst is unpredictable.*" Ex parte Bergeretal, (POBA 1952) 108 USPQ 236. Just because a

chemical component works in one catalyst system, does not mean it will automatically work in another. Furthermore, in KSR International co. vs Teleflex, Inc (550 US. (2007), Slip opinion No. 04-1350) the US Supreme Court recognized that "*a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. ... This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what in some sense, is already known.* " (Slip opinion, page 15). Thus, it is clear that using Applicant's specification as a map to cobble together something that appears to be Applicant's invention is not sufficient under 35 USC § 103 to prove obviousness.

Applicant respectfully submits that this is what is happening here. Buchwald discloses ligand-metal complexes and methods to use them in reactions, such as Suzuki coupling, amination, diaryl ether synthesis, ketone arylation and Heck reactions (Buchwald Figure 1, column 1, line 65- to column 2, line 1). Buchwald is for use in small molecular synthesis and does not relate to olefin oligomerizations/polymerizations and catalyst compounds for such. One of ordinary skill in the oligomerization or polymerization art would not look to Buchwald for oligomerization or polymerization catalyst compounds. It is only with hindsight reconstruction that one would find Buchwald and combine it with Qian.

Examiner's Response to Previous Arguments.

The Examiner has responded to previous arguments by making several conclusory statements that do not properly support a finding of obviousness (see MPEP § 2143 (pg 128 "rejections based on obviousness cannot be sustained with mere conclusory statements"). Furthermore, the Examiner's statements purported to set out scientific "theories that hold true under most conditions." With regard to such theories, MPEP § 2144.02 states: "*The rationale under 35 USC § 103 may rely on logic and sound scientific principle (citations omitted). However, when an examiner relies on a scientific theory, evidentiary support for the existence and meaning of that theory must be provided.*" (citations omitted)

Applicant respectfully request that the Examiner provide evidentiary support for the existence and meaning of that theories stated in the office action dated February 22, 2008,

including but not limited to:

1) "In organomatallic/coordination chemistry both hydrocarbyl and halogen ligands carry a negative 1 charge;"

2) both hydrocarbyl and halogen ligands are polar on a metal center only hydrocarbyls are sigma donating halogens are sigma withdrawing;

3) while both hydrocarbyls and halogens will act differently in their tug of war for electrons with the metal center, these interactions are well understood and can and are used regularly to "tune" the activity of a particular metal system;

4) since there are a limited number of main group elements to bind a metal center and halogens and hydrocarbyl among some of the most frequently used and interchanged;

5) they carry the same unit charge and substituting one for another does no change the oxidation state or electron count *sic* [at] the metal center;

6) one could tune the activity to optimize through routine experimentation the electronic character of the metal center …if it was desired to increase or decrease the electron density at he metal center;

7) since neither halogen nor hydrocarbyl ligands are strong field ligands;

8) one would not expect any change in the orbital or geometric configuration; and

9) a slight change in sigma donation that can be adjusted by going from methyl to secondary to tertiary hydrocarbyls to halogens and from F to I to finely tune the metals activity.

Finally, the Examiner suggests that Applicant is merely tuning the catalysts of Buchwald in view of Qian. Applicant respectfully disagrees. If this were so, the "tuned" systems would make the small molecules better, faster or cheaper. It would not make a completely different molecule, like Applicant's polymers.

In light of the above, Applicant respectfully request that the rejections be withdrawn.

Rejections Under 35 USC § 102(b)

The previous rejections under 35 U.S.C. §102(b) over Buchwald et al. (U.S. Patent No. 6,307,087) have been withdrawn.

Double Patenting

The rejection of Claims 2-6 and 9-17 under the judicially created doctrine of obvious type double patenting (ODP) over claims 1-20, 27-31and 36-40 of USSN 10/692,827, filed October 24, 2003 has been withdrawn.

Related Application

This application relates to similar subject matter in USSN 10/692,827, filed October 24, 2003. The Examiner is encouraged to review both applications in light of each other.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and respectfully requests notice of such.

Please charge any deficiency in fees or credit any overpayments during the entire pendency of this case to Deposit Account No. 05-1712. Please also charge any petition fees, including fees for extensions of time necessary for the pendency of this case or copendency of this application with another application at any time to Deposit Account No. 05-1712.

Any comments or questions concerning the application can be directed to the undersigned at the telephone number given below.

Respectfully submitted,

Date: June 20, 2008

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